

Chapter Twenty-four

ESP¹ EXPERIMENTS AND THE PROBLEM OF SENSORY CUES

THE PITFALLS which lie in the path of the experimenter in telepathy or clairvoyance are seldom appreciated by those who are conducting the experiments. In the past many experimenters with mediums and "psychics" have produced apparent evidence for the existence of supernatural faculties, simply because they have not taken into account such factors as sensory hyperacuity, the involuntary dissemination of sensory cues, and, equally important, the unconscious reception of those cues by the "telepathic" or "clairvoyant" percipient.

Involuntary articulation, from its most rudimentary forms to genuine unconscious whispering, plays a very large rôle in the "thought-reading" performances of many mediums. But the average medium relies mainly on her sitters' conscious or involuntary reactions to her verbal remarks, hesitations, hints, gestures and semi-articulated words. She fishes for reactions which will give her a clue to the circumstances, the names of relatives, and other personal details of her client's life.

It is not proposed, however, to enter here into the *modus operandi* of the successful professional medium. It is sufficient to observe at this point that the unconscious presentation of sensory cues, particularly auditory cues, may satisfactorily account for innumerable instances wherein the sitter has been puzzled by the supposed clairvoyant

¹ Extra-Sensory Perception: A general term which includes telepathy, clairvoyance, "precognition," etc.

power of the medium. Nowhere has the operation of this factor been more effectively displayed than in the experiments carried out by the worthy pioneer investigators of mediumistic abilities.

The great bulk of experiments of Chowrin and Naum Kotik in Russia, of Abramowski in Poland, of Pagenstecher in Mexico, of Schmoll and Mabire in France, of Wassiliewski and Tischner in Germany, of the Sinclairs in America—to mention only a few of the more serious earlier experimenters—provided ideal situations for the involuntary presentation of auditory cues. Even Richet, who was very far from viewing such experiments without bias, observed that with Kotik's two mediums the "telepathic transmission" usually took a *forme phonétique*, and questioned the whole validity of Kotik's conclusions² mainly on that account. Yet to anyone unacquainted with the possibility of slight articulated cues being conveyed involuntarily to the percipient, Kotik's experiments must appear impressive.

In the earlier *clairvoyant* experiments it was usual for the percipient to try and guess words in sealed envelopes, objects in sealed boxes, or drawings in locked brief cases. In this type of experiment the medium often achieved a very high degree of success, but only in those cases when the experimenter or his assistant knew the nature of the item to be divined, which was usually the case. In *telepathy* experiments, when the "agent" is actually concentrating on or looking at the item to be transmitted, the scope afforded for the transmission of cues by involuntary articulation is obviously increased, and even in quite recent telepathy experiments allowance has seldom been made for this factor.

Dr. E. Abramowski's experiments³ are of particular interest in this connection. In 1914, in his capacity as head of the Laboratory of the Polish Psychological Institute in Warsaw, he conducted a long series of purported telepathic experiments in which he, acting as agent, held the percipient's hand. In this manner up to fifty per cent. success in transmission was obtained; but Abramowski

² Kotik, N., *Die Emanation der psycho-physischen Energie*, Grenzfragen des Nerven und Seelenlebens, 61, Wiesbaden, 1908.

³ Abramowski, E., *Le Subconscient Normal*, Paris 1914.

admitted that this was due in part to the unconscious presentation and assimilation of sensory cues. Nevertheless, he believed that the unprecedented percentage of accurate guesses could only be explained by means of telepathy. In making this assumption he certainly erred ; not even the most sanguine of modern ESP experimenters could hope to rival his phenomenal results.

The main lesson to be learned from Abramowski's experiments in telepathy, which he included in his otherwise excellent psychological treatise *Le Subconscient Normal*, is the extraordinary extent to which certain individuals may correctly perceive and interpret slight and unconsciously disseminated sensory cues.

In England and America criticism of experiments in psychical research has been sporadic and ineffectual. In Germany, however, many books have been published during the present century attacking the shortcomings of such experiments and investigations. The most effective counterblasts to the supernaturalism of earlier psychical research have been written by Max Hopp* who conducted experiments of his own on traditional lines without the least evidence of telepathy or clairvoyance forthcoming, and by Moll and Baerwald, noted German psychologists. Moll possessed a wide knowledge of psychical research which showed his fundamental interest in the subject, yet he had no hesitation in rejecting the occult theories of the psychical researcher. In his book *Prophezeien und Hellsehen*⁵ he explained a great deal of the apparently supernatural powers of telepathists, mediums and clairvoyants as due to sensory hyperacuity. Baerwald in his excellent book, *Die Intellektuellen Phänomene*,* also pointed out the large part played by sensory hyperacuity and the unconscious dissemination of cues in psychical research experiments.

It is notable that the efforts of German savants to quash the growing movement of "scientific occultism", as psychical research was called for many years in Germany, largely succeeded. Other factors helped, and during the last

* *Über Hellsehen*, Berlin 1916.

* Stuttgart, 1922.

* Berlin, 1925 ; second vol. in the series *Der Okkultismus in Urkunden*, edited by Max Dessoir.

twenty-five years no development in psychical research parallel to that which has grown up in Britain and the United States has occurred in Germany. Bonn University made a small effort to instigate scientific psychical research experiments under Dr. Hans Bender in 1933, but nothing of any importance materialised. The truth appears to be that the Germans have been far better acquainted with the fallacies involved in the type of investigation exemplified by ESP experiments than have the English or the Americans.

SENSORY HYPERACUITY

There are many ways in which the "telepathic" or "clairvoyant" percipient can gain information through normal sensory channels. The telepathic agent, for instance, may provide interpretable cues by involuntary muscular movements detectable by any of the three senses of sight, hearing or touch. Vaudeville telepathists who use such means as these are known as "muscle-readers". The telepathic percipient, also, may be aided by a highly trained or hyperacute sense of touch, hearing or vision, enabling him, in certain circumstances, to gain valuable sensory cues where the average person would perceive nothing.

People naturally vary from one another in the acuteness of their various senses. Sensory hyperacuity which owes its existence to an abnormally low threshold of sensation due to *physiological* causes, i.e. when the nerve receptors are themselves measurably more sensitive than the normal person's, is usually referred to as sensory *hyperaesthesia*. Genuine hyperaesthesia, however, is a relatively rare phenomenon and there is little evidence that it is responsible for extra-chance scoring rates in ESP experiments. The kind of sensory hyperacuity found among ESP percipients is often the result of training or practise. Even when this is not the case sensory hyperacuity is almost always due to psychological, not physiological, factors. A state of increased concentration and attention, for example, renders the senses more acute *in effect* than when the individual is bored or distracted.

Alternatively the person who possesses a natural mental

alertness, with a facility for fine discrimination, and has what is called a "good ear" or a "good eye" has, in general, far more subtlety of sense-perception than the naturally indolent whose mental equipment only enables him to deal with the more obvious sounds and sights which reach him. The former type can develop his already superior sensory faculties to an extent which often appears incredible. The Australian aboriginal tracker, for example, who rapidly and unerringly follows up a visual trail invisible to the white-man; the proverbial North American Indian who possesses "the eye of an eagle"; the musician who can distinguish simultaneously a great variety of overtones when a bell is struck—overtones which to the majority of people constitute at most two or three separate sounds; none of these is due in any way to hyperaesthesia but to training and practice plus a natural aptitude.

Genuine hyperaesthesia denotes an abnormal sensitivity of the physiological sense organs themselves. Although the eye can, with training, become a more perfect instrument, by enabling the percipient to use the muscles of his eye to better advantage, this does not of itself constitute hyperaesthesia. Similarly, with some hysterical subjects extreme sensitivity to pain may occur without the least physical change in the sensory organs; the sensitivity here is due to psychological causes alone. Under hypnosis some hysterical subjects can be made to see and hear far better than they can normally.

The term hyperaesthesia is commonly used in connection with psychical research experiments and investigations. It will be seen from the above, however, that its continued use would serve only to confuse the issue. Hyperaesthesia refers only to certain abnormal sensitiveness of the sensory nerve terminals themselves. The term *sensory hyperacuity*, which is altogether more appropriate, may denote either an unusual sensitivity in the percipient's *reactions* to given sensory stimuli due to psychological causes, or an increased efficiency of any of the senses brought about by training and practice. It depends largely on the psychological constitution of the percipient. Some people could never become tea-tasters while others could never become piano-

tuners, even though their physical sensory equipment were perfect.

Some individuals possess naturally hyperacute sensory faculties, although pronounced hyperacuity is comparatively rare without training. It is, however, these rare individuals with abnormally developed sensory faculties to whom we must turn our attention if we are to explain some of the apparently inexplicable results produced in numbers of ESP experiments.

William James rightly observed that the limits of the powers of the human mind are unknown; the range of its potential abilities is virtually unexplored territory. Such phenomena as lightning mathematical calculators, infant musical prodigies, accurate estimation of time intervals whilst asleep, increased muscular strength and powers of concentration under hypnosis—all these hint at the existence of mental potentialities about which we know comparatively little.

Hypnotised subjects not infrequently use their normal faculties with considerably greater efficiency than when they are fully conscious. They may lift greater weights, exhibit greater acuteness of sight or hearing and, in general, exercise their talents with increased success. This is because suggestible subjects can usually be brought to a state in which they are entirely concentrated upon one task in hand to the exclusion of everything else. Some individuals achieve such an extension of their normal powers spontaneously without the use of hypnosis, and this applies particularly to the sphere of auditory perception. With the hypnotised subject the sensory faculties may sometimes be heightened to a degree reaching genuine hyperacuity.

Such a heightening of the senses, whether self-induced or brought about by hypnosis, comes from concentrating every mental faculty to the limit of its efficiency. Such concentration may be a subconscious process, the subject remaining, to all intents and purposes, quite relaxed. The great value of hypnosis is that it frees the subject from those inhibitions and self-consciousness which otherwise stop him reaching that peculiar pitch of concentration where his mental faculties achieve the maximum efficiency.

Experiments in increased sensory acuity by means of

hypnosis have, in the main, been confined to subjects with hysterical tendencies. The relationship between hysteria and hypnosis is a close one, and many hysterical patients in the past have shown a high degree of spontaneous sensory acuity. Many mediums show well-developed hysterical symptoms, and in trance states of hysterical origin the medium is probably helped a great deal by an accentuated sensory acuity or heightened powers of observation due to this factor.

To some extent the normal individual also can achieve heightened states of concentration conducive to the increase of his sensory acuity. If he relaxes his muscles, forgets the world around him and fixes his mind on one task—for example the task of picking up slight informative cues disseminated involuntarily by an ESP experimenter or a “telepathic” agent—he will often be able greatly to augment those powers of attention, discrimination, concentration and subtle rationalisation upon which the increased efficiency of his sensory faculties depend. Such methods bring into operation the full powers of the subconscious mind undistracted by events in the immediate environment.

SENSORY CUES

In telepathic and clairvoyant exhibitions by mediums, vaudeville telepathists or ESP subjects, it is surprising how much can be inferred from slight cues provided by involuntary movements and sounds, barely perceptible differentiations of light and shade, changes of facial expression, innervations of the vocal muscles, tensions of the facial and cervical muscles, alterations in rate, rhythm, time and evenness of the breathing, *apart* from any question of sensory hyperacuity on the part of the percipient. With gifted subjects who can use to the full their powers of subconscious assimilation and ratiocination, the chances of correctly interpreting such faint cues are greatly increased. The ability of the subconscious mental processes to utilise the slightest cue has been shown time and again in experiments with hysterics. The powers of lightning calculation possessed by some infant prodigies well exemplify the potentialities of subconscious mental operations.

The psychical researcher and ESP experimenter must be fully cognizant of the difficulties of excluding sensory cues before he undertakes any investigations in his chosen sphere. Very seldom, however, have such investigators shown, judging from their books and reports, that they possess the requisite knowledge ; and it is hard to avoid the conclusion that the great bulk of the " successful " experimental results reported are directly attributable to ignorance of the difficulties involved.

It is evident from this brief introduction that all telepathy and clairvoyant investigations should be carried out under such conditions as to leave not the slightest doubt as to the complete *physical impossibility* of sensory cues being gained by the percipient. The vast majority of ESP tests do not observe this condition. If the possibility of subconsciously-motivated scoring errors, fraud and the like are excluded, the relatively small amount of extra-chance successes achieved by the averagely successful ESP percipient in reasonably well controlled zener-card experiments may well represent the degree to which the occasional sensory cue has been unconsciously disseminated, observed and interpreted—perhaps once or twice in every hundred or so guesses.

Where constant and slight *enneurosis* (innervation) of the vocal muscles on the part of a telepathic agent is the only source of the sensory cues, the average percipient will be lucky—if the distance is over a yard or two—to catch more than an occasional indication of the nature of the card the agent is looking at ; and only a percipient with very acute hearing will be able to register them to any marked extent. This is undoubtedly the main explanation of Dr. S. G. Soal's amazing experiments, although one curious feature of these experiments demands something more than simple explanation on these lines. Yet Dr. Soal's experiments, it may be noted in passing, do *not* exclude an explanation in terms of the operation of sensory cues, as will be seen in a later chapter.

To render the operation of sensory cues totally out of the question in ESP experiments, recourse should be had to a lightproof and soundproof cabinet in which to seat the percipient ; or alternatively he must be placed at such a distance from the agent that all physical means of communi-

cation between them would be a literal impossibility. Such a cabinet has not been used by ESP experimenters, and although a fair number of distance experiments have been carried out few will claim that such experiments present cogent evidence for the operation of telepathy or clairvoyance.

Even in clairvoyance (as opposed to telepathy) experiments the situation is not so simple as might at first appear. For example, the percipient may be required to guess the order of a pack of cards enclosed in a *locked metal box*. Yet the precaution of a locked metal box would not in itself be enough. The person who places the pack in the box must also be prevented from either seeing or conversing with any person who is going to make contact with the percipient (after the cards are in the box) either before or during the experiment. In other words the person who places the cards in the box must be allowed no subsequent contact with *anyone* who is involved in the experiment until after the cards have been checked. This precaution has seldom been taken. Chowrin's experiments in hysterical hyperacuity of the senses suggest only too clearly the possibility that the *supervisor* of the experiment may unconsciously gain cues at second or third hand through the medium of involuntary articulation and convey them to the percipient by the same means.

The well-publicised experiments of Rhine and other American ESP experimenters must be rejected on collateral evidence of bias and tendentiousness as judged from the presentation of their reports. Even so, the great majority of their clairvoyant experiments are indictable on grounds of insufficient precautions against the sensory cues. For example, an apparently excellent series of clairvoyant experiments carried out by Pratt and Woodruff at Duke University¹ were designed to demonstrate the influence of novelty in the target material. The actual report of the experiments is of a high standard and triple score-records were made. In these experiments a total of 66 subjects were tested. The number of card guesses involved was 97,000. The technique generally used was *screened touch-matching* with modifications.

¹ *Size of Stimulus Symbols in Extra-Sensory Perception*, J. Parapsychol., III, 1939, pp. 121-157.

There were two main series of experiments. In the larger B series the results of over 60,000 guesses produced a relatively low critical ratio of 4.99. Series A, which were conducted under less well controlled conditions, showed a correspondingly higher critical ratio of 6.28, which is precisely what might be expected if the scoring successes were due solely to the intervention of sensory cues. Alternative theories to explain the greater success of the less well controlled series can be considered only when it has been proved that the intervention of sensory cues was not only improbable but *impossible*. Analysis of the screened touch-matching method, however, renders this out of the question.

That 66 subjects should show, *en masse*, strong evidence of "extra-sensory" perception is so contrary to what other ESP experimenters have found, particularly Soal, that the results are in themselves automatically suspect. When we hear that the screened touch-matching technique involves the personal handling of a face-down pack of cards by the experimenter who is sitting only a couple of feet away from the percipient, the claim to have imposed the strictest experimental controls must raise a smile.

The only value of a screen between the percipient and the experimenter is that it probably prevents direct visual cues from reaching the percipient. If, in the absence of a screen, the possibility of direct visual cues reaching the *percipient* is admitted, then plainly the same possibility exists in regard to the experimenter; for he can not only see the backs of the cards but he can also touch the backs of the cards and probably the faces as well. Any information he may get from the cards, perhaps subconsciously, may be readily transmitted by unconscious articulation or *endophasic enneurosis*, by an auditory code of ideomotor movements, by intonations and variations in the breathing, or by involuntary reactions to any tentative movements of the percipient's pointer over the exposed "key-cards". Both series of the Pratt-Woodruff experiments are potentially open to an interpretation on these lines.

In the conscious or unconscious detection of slight sensory cues a certain degree of mental alertness is essential. Where boredom intervenes, the subject's alertness drops. Novelty or other aids to re-engage the interest will naturally revive

the *qui-vive* of the subject and prevent staleness. This is all that Pratt and Woodruff appear to have established—not, as Dr. J. B. Rhine hints, something bearing on the “laws” of extra-sensory perception.

The shortcomings of the screened touch-matching technique are quite obvious. Yet of these Pratt-Woodruff experiments Rhine has written: “For sheer top-heaviness of safeguarding measures, probably no comparable experiment has ever been conducted.”^{*}

The claim to have established by such experiments the existence of a new causal principle unknown to modern science is, of course, ludicrous. To prove such claims the criteria of the *exact sciences* must be rigidly adhered to; they are the only ones which could satisfy the scientific world, and this is what all psychical researchers and ESP experimenters fail to recognise. Rhine’s comment on the Pratt-Woodruff experiments is a good illustration of the occult researcher’s fallacious outlook.

There are several different ways in which the percipient may gain the requisite sensory cues during clairvoyance or telepathy experiments. First, there is the straightforward possibility of direct vision—the percipient being able to see the card or object to be guessed or to infer their nature by slight visual cues. Another possible source of information is through the sense of touch. Allied to this is the faculty we possess of detecting differences in the weights of objects; this, and the use of the sense of smell, may be of some value to the medium or clairvoyant, although in the average zener-card experiment they can be discounted.

The sense of hearing is the chief means by which informative cues are conveyed to the ESP percipient; and directly connected with this is the whole problem of unconscious movements and endophasic enneurosis on the part of the agent or experimenter, and the conscious or *unconscious* detection and interpretation of the resultant sounds by the percipient. Obviously, both the dissemination and reception of such sensory cues can be a conscious, and even a deliberate business; but in the following pages we shall concern ourselves mainly with the more interesting unconscious variety.

^{*} *The Reach of the Mind*, 1947, p. 37.

Unconscious movements by the telepathic agent may not only be seen—they may be *heard* by the percipient; or, if they are in contact, they may be felt. In modern ESP experiments, however, the latter possibility seldom occurs, although in Abramowski's long series of telepathic experiments already referred to, detection of the agent's unconscious movements occurred mainly through the sense of touch—the percipient holding the agent's hand.

It would seem a very simple matter in ESP experiments to exclude the possibility of the percipient obtaining information by the direct use of the sense of sight. Yet in Rhine's early zener-card experiments, as was subsequently shown, it was often quite easy to detect the symbol on the card-face from the back when viewed from certain angles. The symbols printed on the front of the cards had been impressed too hard, rendering their outlines discernible on the reverse sides. That Dr. Rhine should have published the results of such experiments in the first instance as evidence of *telepathy* or *clairvoyance* is almost incredible. Nothing can dispel the impression of carelessness thus created, which the partisan tendentiousness of subsequent reports and books has done little to dispel. Yet it is Dr. Rhine himself who, more than any other ESP experimenter, upbraids the world of science for not having the breadth of outlook to admit the "fact" of extra-sensory perception!

In these early card-guessing trials the percipient was generally allowed to see the backs of the cards, and even to handle them. The possibility of obtaining visual and tactile cues by such means—apart from the question of the symbols showing through the backs—is evident. Any card can be identified visually from its back once the percipient has had a chance to see the front. It is similarly possible to identify a card by touch through noting small irregularities on the back or edges.

Reflections, of course, are easily guarded against if the proper precautions are taken. But the test-table is not the only possible source of reflections. Slight variations in reflected light and shade, even on relatively poor reflecting surfaces, may be sufficient to provide the necessary cue when the percipient has only a limited number of symbols to guess from, each with its characteristic shape. There is always

the very important possibility, too, that the test supervisor or one of his assistants may catch some visual cue and pass it on unconsciously to the percipient.

The question of the unconscious dissemination of sensory cues by telepathic agents will be dealt with at length later. Meanwhile we may note that in *clairvoyance* tests, where there is no ostensible agent, the supervisor, his assistant, or an observer may unconsciously provide cues to the percipient when the conditions of the experiment allow the cards to be seen or touched by them, as has been the case in a great many of the American clairvoyance experiments.

The sense of touch is capable of great development beyond the normal degree of sensitiveness. It is in fact possible for some people to designate correctly, by touch alone, the name of most cards in the pack, using the average commercial brand of playing-cards. Among the blind tactile sensitivity is sometimes remarkably developed. For example, Professor Villey records that the *hyperaphia*, or extreme tactile sensitivity, of some blind women enables them to distinguish the different colours of the wool they are using through the effect produced on the wool by the dye; while Professor Fontan once reported a case of hystero-epilepsy in which the patient could discriminate between variously coloured wools in complete darkness by virtue of her increased tactile responsiveness. Hyperacuity of the senses, as we have already seen, may be occasioned by hysteria or hypnosis.

Despite some extraordinary feats of the tactile sense by a few individuals, there is no basis whatever in the claims once made by the renowned French writer, Jules Romains, that there exists any such faculty as "Extra-Retinal Vision" or the "Paroptic Sense". Romains, in his book *Eyeless Sight*, describes how he made numerous experiments early on in his career regarding a hypothetical sensory function analogous to sight but operating via the medium of the subject's skin. Colours and letters could thus, according to Romains, be identified at a distance. Furthermore, he claimed that the "paroptic perception of colours continues noticeably beyond the lowest illumination with which visual perception of colours can occur". This, oddly enough, is precisely what Chowrin claimed to have found years previously in his

experiments with a hysterical subject.¹ But these fantastic results of Romain and Chowrin were quite certainly due to unconsciously articulated cues against which neither experimenter seems to have taken any precautions at all.

The whole of Romain's book *Eyeless Sight* is an excellent illustration of the degree to which self-deception may occur when there is complete ignorance of such psychological principles as the involuntary and unconscious dissemination of sensory cues. The detailed telepathic experiments of the Polish psychologist Abramowski is another case in point.²

Dr. Soal's investigation of the vaudeville telepathist "Marion" was a good demonstration of how the practised individual can detect a playing-card blindfold or in the dark once he has had an opportunity to touch it beforehand: "Marion displayed great aptitude for recognising a playing card that he had once touched when this card was mixed with several other cards of similar make and pattern."³ Marion usually did this by imparting a slight bend to the card in question, which he was able to detect when he later went through the pack to locate it. He could also identify in the dark, stiff millboard cards, which he had previously been allowed to hold, by means of his sensitive touch alone. But, reported Dr. Soal, "when tactual and visual cues are completely ruled out Marion succeeds no more often than chance would predict". The skill needed to memorise and detect slight irregularities in a stiff card is, in Marion's case, acquired through years of practise. It can not, however, be ruled out that specially gifted individuals are able to do this spontaneously and even unconsciously.

The means used by Marion to detect cards cannot be directly applied to the usual type of ESP experiment, except perhaps where the percipient—or any other person present during the experiment who remains within visual and auditory range of the percipient—has had an opportunity of seeing or holding the pack of cards used during, or *previous to*, the experiment. This, however, has very often happened:

¹ Chowrin, A. N., *A Rare Form of Hyperaesthesia of the Higher Sense-Organ*, Contributions to Neuropsychic Medicine, Moscow, 1898.

² See *Le Subconscient Normal*.

³ Soal, S. G., *Preliminary Studies of a Vaudeville Telepathist*, University of London Council for Psychical Investigation, Bulletin III, 1937.

the contingency is aggravated when a particular pack has been used in more than one experiment. Dr. Soal, himself a firm believer in telepathy, points out in his report that these experiments with Marion "suggest a most serious source of error in a great many of the card-guessing tests described by Miss Ina Jephson and Dr. J. B. Rhine."⁴

Another source of sensory cues in Rhine's earlier experiments has already been referred to: namely, that the impress of the symbol on the face of the card was often visible from the back when held at certain angles. In these experiments the identity of such cards could clearly have been revealed by the sense of touch alone, if the percipient was allowed to handle them, which in many cases he was.

In view of the great uncertainty involved in allowing the percipient to handle the cards, it must be accepted as a cardinal principle in all ESP experiments that the percipient be allowed no possible chance of touching them. Yet even if the percipient is effectively prevented from receiving any *direct* visual or tactile clues, the possible sources of sensory cues, apart from those already mentioned, are still numerous—a fact seldom appreciated by ESP experimenters.

TELEPATHY AND IDEOMOTOR MOVEMENTS

We now come to a range of psychological phenomena which, following Tarchanow, we shall classify under the single heading of *ideomotor movements*. These may be loosely defined (in this context) as slight *involuntary* muscular actions which are directly attributable to the existence of a prevailing idea in the mind. *Ideomotor action* was a term originally introduced by Carpenter in 1874 and the concept was developed by William James as a theory of conation. Although the term has since been largely discarded by psychologists, we shall retain it here, confining it to the sense in which Tarchanow employed it in his study of involuntary movements in relation to "thought-reading"⁵.

⁴ op. cit., p. 94.

⁵ Tarchanow, J., *Hypnotisme, Suggestion et Lecture des Pensées*, Paris, 1891.

Ideomotor actions may result either from conscious ideas, or from ideas of which the subject is not immediately aware and which may be called subconscious. A distinction must be made, however, between ideomotor action and psychological automatism. For in the latter the idea which produces the movement is said to be dissociated from the main stream of consciousness of the individual; this is not necessarily the case with ideomotor movements, which are in fact a natural and constant accompaniment, in one form or another, of all our mental activity, particularly when the emotions are in any way aroused.

The two chief investigators of ideomotor actions in relation to the occult were the Russian psychologist Tarchanow, and the well known American psychologist Jastrow. It is doubtful whether either had studied the reports of the other on the relation of ideomotor movements to telepathy and muscle-reading. But they both came to the same conclusions and arrived at them by using much the same methods—though the Russian psychologist used a rather more elaborate equipment and technique than his American confrère.

To give an illustration of the operation of ideomotor movements, we can do no better than to describe the main features of Jastrow's apparatus and one of the techniques which he used for studying them.

Since ordinary ideomotor movements are often very slight Jastrow and Tarchanow required apparatus of considerable delicacy for registering them. Jastrow's apparatus was simple: a square wooden frame contained a plate of glass upon which were placed three polished steel balls. These balls supported another framed plate of glass. Attached to the upper frame was a rigid rod which terminated in a recording apparatus. A complete record of every movement of the upper glass frame could thus be traced upon sheets of glazed paper by this means.

To use this automatograph, or tremograph, the subject places the tips of his fingers upon the glass plate which is supported by the three ball-bearings. It is virtually impossible to hold the plate still for more than a few seconds, particularly if a screen renders the subject's hand invisible to its owner. Under these conditions the subject is instructed

to think as little as possible of his hand, and at the same time to make a reasonable effort to prevent it from moving. As long as the subject's attention is not fixed upon anything in particular, the resulting involuntary shaky movements of his hand produce a random meaningless pattern on the recording apparatus. But if the subject's attention is fixed on some object in the room, the pattern produced is that of an irregular line whose general direction lies towards the focus of attention. Again, if the subject is directed to count silently the ticks of a metronome, or even merely to watch its movements, the record shows that his hand moves to and fro—not accurately but in a general way—in time with the instrument. Tarchanow's experiments showed that if his subjects concentrated for any length of time upon an object, the resultant pattern showed "sometimes the figure of a square, sometimes the figure of a triangle or a circle, according to the dominant form of the object". With geometric figures this tendency was even more marked.

In one of Jastrow's experiments the subject was asked to concentrate his attention for thirty-five seconds upon some patches of colour on the wall opposite. Without warning, the subject was then directed to count the strokes of a metronome for the same length of time. The sudden change completely altered the style of the ideomotor movements as revealed by the automatograph.

Jastrow and Tarchanow both found that unconscious ideomotor actions manifested themselves in slight movements of the whole body, generally in the form of an irregular swaying. By fixing the apparatus to the subject's head the movements could be recorded. It was found that in regard to these slight swaying movements there was a general movement towards any object of attention.

Not everybody shows the same degree of style of ideomotor activity; some people show very little, while others can be extraordinarily responsive. The latter are potentially excellent agents in certain types of vaudeville "telepathy" exhibitions.

Towards the end of the last century in Europe and America, great interest was aroused by the seemingly inexplicable feats of telepathy performed by professional "telepathists", both on the public stage and at private exhibitions. Some

of the exhibitions were extremely impressive, but in time the secret leaked out, and those who knew what was involved no longer talked about "thought-reading" but of "muscle-reading" instead. Thought-readers, it was noted, preferred to take hold of the hand, or place their palm on the forehead of the person whose thoughts they wished to "read". Alternatively they kept them well within sight. When either of these conditions was absent—unless the thought-reader attached himself to his subject, as for example, by means of a rod or piece of string—nothing very much occurred.

Now "muscle-reading" is usually a highly skilful business. It is not limited only to the correct interpretation of slight ideomotor movements. Changes in breathing, slight flushing and tremors, changes of tension and relaxation, changes of expression—these factors and many others "help the muscle-reader in his act.

The traditional muscle-reading act is very different from, and relatively far simpler than, the modern ESP type of experiment. The former, in point of fact, is confined to a very limited kind of performance and depends almost entirely upon the muscle-reader playing a kind of "hot or cold" game with his subject or with his audience.

The older brand of muscle-reader excelled in such problems as finding objects hidden about the room or on one among a number of persons, finding a letter or a word on a certain page of a book, writing down words or ciphers thought of by another person, finding on a piano the notes of well-known melodies, identifying playing-cards chosen from a pack by members of the audience, or finding an object hidden in one of a number of identical boxes. Some of the tricks require greater skill and practice than others. The finding of hidden objects in the auditorium of a theatre is relatively simple; for the unconscious reaction and the involuntary movements of the audience often enable the experienced muscle-reader to go straight to the place where the object is hidden with the minimum of hesitation.

On the other hand, such tricks as finding a melody on the piano take the muscle-reader a longer time and depend on the skilful use of tentative trials of notes and observing the reactions of the audience, or on noting their reactions

as his fingers hover tentatively over the keys. To find a word in a book the same tentative and exploratory method is used. In both these types of performance, which naturally depend on a limited number of witnesses, the spectators must, of course, be able to watch what the muscle-reader is doing. All such performances of muscle-reading are much facilitated if the muscle-reader holds the hand of the subject whose thoughts he is trying to "read", or touches some part of him; with this aid most of the muscle-reader's tricks can even be carried out blind-folded. With very acute hearing he could undoubtedly solve the problems by hearing alone. Again, some of Tarchanow's experiments in muscle-reading were effected successfully through the muscle-reader being connected to his agent by a chain or a wire after having been blindfolded and having had his ears plugged!

Jastrow sums up thus the means whereby the vaudeville telepathist solves his problems: "In the exhibitions of muscle-reading, the changes in breathing, the flushing, the tremor of the subject when the reader approaches the hiding place, and the relative relaxation when he is on the wrong scent, serve as valuable clues; to borrow the apt expression of "hide and seek", the performer grows "hot" and "cold" with his subject. Then, too, the tentative excursions in one direction and another, to determine in which the subject follows with least resistance, present another variation of the same process. The hushed calm of the audience when success is near, the restlessness and whispering during a false scent, are equally welcome suggestions which a clever performer utilizes, thereby adding to the *éclat* of his exhibition. . . . When a combination of numbers or of letters in a word is to be guessed, the operator passes over with the subject the several digits or the alphabet, and notes at which the tell-tale tremor or mark of excitement occurs, and so again performs the feat on the basis of the involuntary contractions that express the slightest changes of attention or interest when the correct number or letter is indicated."¹

Many spiritualistic mediums use the method of "muscle-reading" to gain their information. They talk, often at random, throwing out tentative suggestions, words, places,

¹ *Fact and Fable in Psychology*, p. 334.

names and the rest and noting the reactions of their "sitters". With an ouija-board some American mediums have, in the past, acquired an uncanny skill in interpreting the slight hesitations and ideomotor movements of their clients. Jung himself has investigated this aspect of the subject.²

One trick reported in connection with muscle-readers is that of reproducing a line drawing of some object or figure held in the hand of the agent. The tentative strokes of the pencil and the presence or absence of incipient success in what is being drawn produce slight but perceptible involuntary reactions in the agent; whereby the percipient may gauge the failure or success of his drawing as it develops before the agent's eyes.

In most cases muscle-readers detect their agents' involuntary reactions by watching them, i.e. by the sense of sight. The main exception to this is when the muscle-reader is touching the person of the agent or is connected to him in some way—such as by a rod or piece of string. In Soal's investigation of the vaudeville-telepathist Marion it became clear that Marion confined his observations in the main to watching the agent's face and head. When the agent's body was hidden by a screen, Marion was still able to locate hidden objects, to identify playing cards chosen by the agent from among a number of others, and to carry out other exhibitions of "psychometry" and "telepathy". Once the agent's face was covered, however, Marion was helpless.

An important question arises as to whether muscle-readers are always aware of the method they themselves use to carry out their feats of "telepathy". In Marion's case Dr. Soal reports that he quite genuinely believes that he does it by telepathy. It is probable, writes Soal "that after years of practice, the reading of *indicia* has become a subconscious mental process which Marion is entirely unable to analyse".³

Unconscious observation and interpretation of sensory cues can be a very deceptive phenomenon, and there is no longer the least shadow of doubt that it occurs with many ESP percipients. It is deceptive in that *the percipient him-*

² See *Collected Papers on Analytical Psychology*, 1920.

³ *Preliminary Studies of a Vaudeville Telepathist*, p. 36.

self, with his mind impregnated by notions of telepathy and other occult ideas, cannot recognise the true cause of his success in such experiments, and finds in these successes false confirmation of his own irrational beliefs. That cues can be gained and utilised without the conscious awareness of the individual is well exemplified by the unexpected results of Jastrow's experiments with an electro-magnet.⁴

IDEOMOTOR MOVEMENTS AND ESP TESTS

While the traditional muscle-reader probably shares to some extent with the ESP percipient the faculty of noting and interpreting involuntarily-given clues without conscious awareness, the traditional muscle-reading act has little connection with the modern type of ESP experiment. The methods of muscle-readers have been mentioned in some detail because by no means all ESP experimenters appear to be aware of them, and they indicate very clearly the type of experiment which any believer in extra-sensory perception must avoid if he wishes to have his results taken at all seriously.

The modern type of ESP experiment generally consists in the percipient guessing the order of a pack of 25 cards containing five symbols—star, waves, circle, cross and rectangle. He cannot make tentative calls to test out the involuntary reactions of the agent, the supervisor, or any one else who is cognizant by accident or design of the order of the cards, although in some types of ESP experiment exploratory movements of a pointer could bring about the same result. This would therefore appear almost to rule out the possibility of any form of muscle-reading in the majority of ESP tests, for even if the percipient were able to see or hear any involuntary movements he would have difficulty in identifying them with any particular symbol. Yet there is one possibility, which we shall now proceed to discuss.

As will be seen in the next chapter, the Danish experimenters Lehmann and Hansen noted that the concentration for any length of time on a word tends to produce an innerva-

⁴ See p. 418-420.

tion or *enneurosis* of the vocal muscles, corresponding to a rudimentary or incipient form of articulation. They concluded that alterations in the tone of breathing brought about by such a muscular innervation was sufficient to provide the percipient with requisite clues as to the nature of the word in question—provided that the percipient had a limited number of words from which to guess.

Such ideomotor reactions more properly pertain to the subject of involuntary articulation, but they are mentioned here because they form a helpful link between involuntary articulation proper and simple ideomotor reactions. They further point to the possibility of a code being developed from spontaneous ideomotor movements of the lips, tongue and throat muscles. In this connection it is interesting to note a conclusion of Tarchanow's : that after constant repetition—as, for example, in a situation provided by ESP types of experiment—a particular pattern of ideomotor movements of the lips and tongue tends to become associated with particular words *or their corresponding mental images*, unless the attention is directed towards their suppression.

That a particular pattern of ideomotor movements of the lips and tongue, may, after constant repetition, become associated with a particular word, appears to be of great relevance to the standard ESP type of experiment; for here the telepathic agent is trying to “transmit” mentally a continual and random succession of only five symbols. Clearly the constant repetition of the five symbols by the agent ideally fulfils Tarchanow's condition. In many ESP experiments the agent does not “concentrate” on each symbol as it appears but merely gives it a glance without involving the least conscious effort. It is perhaps significant that Tarchanow did not merely confine the pattern of ideomotor movements to *words* only, but also to their corresponding mental images : i.e. the mere sight of an object or its mere mental representation may lead after constant repetition to a consistent pattern of slight ideomotor movements of the lips and tongue. Such a pattern can be regarded as something in the nature of a code—each symbol possessing its own particular pattern of movements.

Soal himself appears to have envisaged approximately

the same idea ; in regard to Rhine's ESP experiments he comments :

“ No such experiments can be considered of any crucial importance if the percipient is able to see any part of the agent's body. Where the percipient has only a small number (5 or 6) figures from which to make his choice, the possibility of visual codes *elaborated unconsciously* when the same agent and percipient work together over any considerable period of time is too patent to be overlooked.” ¹

Unfortunately Soal throughout most of his own experiments has almost invariably overlooked the possibility of such a code being transmitted auditorily to the percipient by means of sounds which the supervising experimenters fail to perceive or recognise ; the case of Ilga K., which will be discussed in detail further on, lends further emphasis to this possibility. Variations in the tone or evenness of the breathing are all that would be required. Soal's precautions would serve only to obviate *visual* cues afforded by a code derived from ideomotor hand-movements, limb or body movements, movements or expressions of the face, and ideomotor movements of the larynx, lips and tongue other than actual involuntary articulation.

It may be objected that any such visual or auditory codes, whether “elaborated unconsciously” or arrived at fortuitously (as Tarchanow has suggested) through the more primitive means of involuntary ideomotor movements, can only operate in ESP tests provided that one condition is fulfilled : viz. provided that the percipient has at some time gained the chance of seeing each type of card at the same time as the agent made the particular pattern of movements or sounds connected with it, so that the percipient can identify the different code movements or sounds which pertain to each card-symbol.

There are several ways by which the percipient might learn the correspondence of the cards with the ideomotor code. Occasional *endophasic* articulation might provide him with the necessary cues. An alternative has been pointed out by the Polish experimenter Abramowski. Abramowski, although convinced of the “fact” of telepathy, did not deny that unconsciously given cues played a con-

¹ *Preliminary Studies of a Vaudeville Telepathist*, p. 33.

siderable part in his experiments, notably through the sense of touch. Unconscious muscular movements by the agent, he explained, can provide the percipient with good clues as to the identity of the words to be guessed, by indicating either the number of syllables in the word, the rhythm of the word, or the accent on the syllables. But such movements also offer the possibility of being seen or as well as being felt, and if ideomotor movements are to be "unconsciously elaborated" into some kind of a code then it is extremely likely that this code would arise spontaneously through the natural rhythms and accentuations associated with normal articulation. Any such code would stand a very good chance of being interpreted very rapidly by the conditions of the ESP tests where only five symbols are used. This is only possible in cases where the percipient has to guess a word from among a limited number, as was actually the case in Abramowski's experiments.

There are, naturally, many limitations to any theory of the transmission of sensory cues solely by this method under the conditions of modern ESP experiments. But sometimes, certainly, it may play a big rôle in helping the percipient to interpret any code based on an individual pattern of ideomotor movements for each particular word, symbol, object or picture in constant use during an experiment.

ESP experimenters should not forget that where the experimental conditions permit the possibility of a person other than the agent touching or seeing the cards—as often occurs, for example, in clairvoyant experiments—it is also possible, apart from any question of unconscious articulation that information concerning their order may be conveyed to the percipient, through hearing or sight, by involuntary movements or a rough ideomotor code.

It is interesting to note that over forty years ago, Northcote Thomas, suggested another source of sensory cues. He attributed many of his own successful results in telepathy tests to the percipient's keen hearing and his ability to interpret the noise of the scorer's pencil on the score-sheet, as the latter wrote down the initial letter of each card for the purpose of subsequent checking. "It is clearly no far-

fetches hypothesis that the ear could detect and interpret the difference of the sound of the pencil according to the name of the suit that was being written.”¹

Where the percipient gains his cues through variations in the agent's breathing, we are not, properly speaking, justified in differentiating the process from what we have called “unconscious articulation”, a subject which will be discussed in considerable detail in the next chapter.

¹ *Thought Transference*, 1905.